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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,112	04/14/2005	Shinji Shimosaki	0149-044719	2110
28289	7590	10/04/2007		
THE WEBB LAW FIRM, P.C. 700 KOPPERS BUILDING 436 SEVENTH AVENUE PITTSBURGH, PA 15219			EXAMINER ROBINSON, ELIZABETH A	
			ART UNIT 1773	PAPER NUMBER
			MAIL DATE 10/04/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/502,112

Applicant(s)

SHIMOSAKI ET AL.

Examiner

Elizabeth Robinson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 28-32, 34-36 and 63 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 28-32, 34-36 and 63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 28-32, 34-36 and 63 are currently pending.

#### ***Claim Objections***

Claims 34-36 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 34 and 35 require the addition of another material to the photocatalyst. However, as stated in claim 28, from which these claims depend, the photocatalyst consists essentially of titanium oxide. Similarly, the photocatalytic film of claim 36 can have a coloring added to it. This film according to claim 28 should consist essentially of titanium oxide.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 34 through 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. All of these claims can require the photocatalyst to comprise materials other than titanium oxide. It is unclear how this can be accomplished, if the photocatalyst film consists essentially of titanium oxide.

***Claim Rejections - 35 USC § 102***

Claims 28-30, 36 and 63 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamanaka et al. (US 5,919,422).

Regarding claims 28 through 30, Yamanaka (Thirteenth Preferred Embodiment, Column 24, line 52 through Column 28, line 5 and Figures 17 and 18) teaches a photocatalyzer vehicle curtain. The substrate of the curtain (181) is made from a glass-fiber woven cloth, which is coated with a continuous film (183 and 185) of titanium dioxide (a titanium oxide) photocatalyst (Column 25, lines 3-14). The photocatalyst film can be deposited on the glass fibers by vapor deposition (Column 26, lines 15-30).

Regarding claim 36, Yamanaka (column 25, lines 17-22) teaches that the photocatalyst has a light rainbow-like color.

Regarding claim 63, Yamanaka (column 27, lines 53-60) teaches that the photocatalyzer can clean and purify the air.

***Claim Rejections - 35 USC § 103***

Claims 31, 32, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka et al., in view of Boire et al. (US 6,103,363). As stated above, Yamanaka teaches a photocatalytic composite material that meets the limitations of claim 28. Yamanaka (Column 3, lines 9-25) further teaches the substrates on which the coating processes can be used, which include both glass fibers and glass plates. In the Fourteenth Preferred Embodiment (Column 28, lines 53-64), Yamanaka teaches that the process of applying the film to the solid substrate (as in the Fourteenth Preferred embodiment), the film thickness, and the physical properties of the photo-

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catalysts are identical with those of the Thirteenth Preferred Embodiment (glass fiber substrate). Thus, coating solid glass and glass fibers are analogous arts.

Regarding claim 31, Yamanaka (Column 26, lines 15-45) teaches that the photocatalyst has an anatase-type crystalline structure and that the particles should be of sufficiently small diameter (Column 25, lines 45-52), in order to have a high photocatalytic action. Yamanaka does not explicitly teach the size of the crystallites. Boire (Column 1, lines 49-55) teaches coating a glass substrate with a crystalline titanium oxide photocatalyst. Boire (Column 2, lines 5-30) further teaches that crystallites should have an average size of between 0.5 and 100nm, preferably 1 to 50 nm, in order to have an optimum photocatalytic effect. The particles of Yamanaka either are inherently of a size that meets the limitations of the instant claim, or it would be obvious to one of ordinary skill in the art to form crystals of this size, as taught by Boire, in order to maximize the photocatalytic effect.

Regarding claim 32, Yamanaka (Column 26, lines 15 through 45) teaches that the film can be formed by vapor deposition, but does not specify the details of this process. Boire (Column 7, lines 30-52) teaches that vapor deposition is advantageous because it allows continuous coating directly on the substrate. Boire further teaches that the vapor deposition can be performed with titanium tetrachloride. It would be obvious to one of ordinary skill in the art to coat the glass fiber substrate with a titanium tetrachloride vapor deposition, in order to make processing easier by directly coating on the substrate.

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Regarding claim 34, Boire (Column 2, lines 40-67) teaches that a photocatalytic coating can also comprise silicon oxide, zirconium oxide or aluminum oxide, in order to lower the refractive index of the coating, so as to lower the reflection of the substrate. It would be obvious to one of ordinary skill in the art to add another metal oxide to the titanium oxide photocatalyst of Yamanaka, to reduce the refractive index of the coating to minimize reflection from the vehicle curtain.

Regarding claim 35, Boire (Column 3, lines 15-31) teaches that a photocatalytic coating can be doped with a metal oxide, in order to amplify the photocatalytic effect. Many of the listed metals are transition metals. It would be obvious to one of ordinary skill in the art to dope the photocatalytic coating of Yamanaka with a transition metal oxide, as taught by Boire, in order to amplify the photocatalytic effect of the photocatalyst coating.

#### ***Information Disclosure Statement***

In regards to the correction to the document number from the IDS dated August 18, 2005, the reference JP 11-512337 has been considered.

#### ***Response to Arguments***

Applicant's arguments with respect to claims 28-32, 34-36 and 63 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. A formal English translation of Yamaguchi (JP 2001-335343) is included with this Office Action as was stated in the Office Action of April 19, 2007.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Robinson whose telephone number is 571-272-7129. The examiner can normally be reached on Monday- Friday 8 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ear



**CAROL CHANEY**  
**SUPERVISORY PATENT EXAMINER**